

Trend Analysis and Detection of Changes in the Stratospheric Circulation □ L. Oman¹;
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Increases in the circulation of the stratosphere appear to be a robust result of climate change in chemistry-climate models over decadal time scales. To date observations have yet to show a significant change in this circulation. It is important for the design of future observational missions to identify suitable atmospheric constituents and to determine the accuracy and length of record needed to identify a significant trend that can be attributed to circulation change. First, we determine what atmospheric variables can be used as proxies for stratospheric circulation changes. A few examples are changes in tropical lower stratospheric ozone, phase lag of the water vapor tape recorder, CO₂, and SF₆. Then, using both the Goddard Earth Observing System Chemistry-Climate Model (GEOS CCM) and observations from satellites and balloon soundings, we calculate the number of years needed to detect a significant trend, taking into account observational uncertainty. Model simulations will be evaluated to see how well they represent observed variability. In addition, the impacts of autocorrelation among the output or data and gaps in the observational record will be discussed.